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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,109	02/27/2004	Taro Inoue	NIT-413	5067

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EXAMINER	
SCHELL, JOSEPH O	

ART UNIT	PAPER NUMBER
2114	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/787,109	INOUE ET AL.	
	Examiner	Art Unit	
	Joseph Schell	2114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

Claims 1-9 have been examined.

Claims 1-9 have been rejected.

Claim Objections

1. Claim 4 uses the terms "the inter-subsystem copy" and "the intra-subsystem copy" which lack antecedent basis within the claim. Examiner assumes that this claim is instead dependent on claim 3, which recites these terms.

2. Claim 7 lines 8-7 state "execute copying from a point to which the copy processing has progressed before the failure." This wording is awkward. The examiner suggests at least changing the claim to read "execute copying from a point to which the copy processing **had** progressed before the failure."

3. Claim 9 line 12 uses the term "each processing of a remote copy." This limitation lacks antecedent basis

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 6 line 15 states the limitation "each of the other operation sites." This limitation lacks antecedent basis within the claim as line 2 limits the claim to "one or

more operation sites." Line 17 of the claim also states "said of each of the other operation site," which needs at least correct grammar, depending on how the limitation of line 15 is handled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai (US Patent 6,173,377).

6. As per claim 1, Yanai ('377) discloses a computer system in which one or more operation sites and a site having a storage device subsystem are mutually connected through a network (column 2 lines 37-40), wherein:

said operation site includes a copy management program that operates in a host, and copy management information (column 3 lines 8-13, the primary and secondary controllers maintain lists of primary data to be copied);

said copy management information includes state information that is used by the copy management program to execute a remote copy (column 3 lines 8-20); and

said copy management information is stored in a storage device of a storage device subsystem included in this computer system (the subsystem is not being

interpreted as limited to the managed disk storage, but instead includes controller memory including update lists (see column 3 lines 9-12)), and is updated every time a remote copy is executed (column 3 lines 31-41).

7. As per claim 2, Yanai ('377) discloses a computer system according to claim 1, wherein: when the operation site fails, the copy management information stored in the storage device of the storage device subsystem included in each site is referred by use of a copy management program that operates in a host included in another operable site to execute copying from a point to which the copy processing has progressed before the failure (column 26 lines 46-51).

8. As per claim 3, Yanai ('377) discloses a computer system according to claim 1, wherein: said storage device subsystem can make an inter-subsystem copy of data stored in a storage device between the storage device subsystems, and can also make an intra-subsystem copy of data stored in a storage device in the storage device subsystem (column 13 lines 63-65, each storage may contain local redundancy).

9. As per claim 5, Yanai ('377) discloses a computer system according to claim 1, wherein: said copy management information is stored in a storage device of a storage device subsystem in each site included in this computer system (column 2 lines 40-43, the primary and secondary controllers exist at different locations and column 2 lines 49-52, mirror management information is maintained on at least one controller. Also see

column 3 lines 9-10 which state that the primary and/or secondary controller maintain a list of data to be copied, this use of and/or anticipates both controllers keeping a mirrored list).

10. As per claim 6, Yanai ('377) discloses a failure recovery method for a computer system in which one or more operation sites and a site having a storage device subsystem are mutually connected through a network (column 2 lines 37-40), said failure recovery method comprising the steps of:

using, by the operation site, a copy management program, which operates in a host, to remote-copy data stored in a storage device of a storage device subsystem included in the operation site to a storage device of a storage device subsystem included in each of the other sites (column 2 lines 40-44);

every time copy processing is performed, reflecting, by the operation site, a state of the remote copy in copy management information stored in the storage device of the storage device subsystem included in the operation site (the subsystem is not being interpreted as limited to the managed disk storage, but instead includes controller memory including update lists (see column 3 lines 9-12); and

every time copy processing is performed, reflecting, by each of the other operation sites, a state of the remote copy in copy management information stored in the storage device of the storage device subsystem included in said each of the other operation site (column 3 lines 9-20, various lists are maintained and updated as data is

altered and column 11 lines 9-14, lists are stored on each physical and logical storage device).

11. As per claim 7, Yanai ('377) discloses a failure recovery method for a computer system according to claim 6, wherein:

when the operation site fails, the copy management information stored in the storage device of the storage device subsystem included in each site is referred by use of a copy management program that operates in a host included in another operatable site to execute copying from a point to which the copy processing has progressed before the failure (column 26 lines 46-51).

12. As per claim 8, Yanai ('377) discloses a failure recovery method for a computer system according to claim 6, wherein:

said step of remote-copying from the operation site comprises inter-subsystem copying of data in a storage device which is performed between the storage device subsystems, and intra-subsystem copying of data in a storage device which is performed in the storage device subsystem (column 13 lines 63-65, each storage may contain local redundancy); and

said copy management information includes state information about each of the inter-subsystem copy (column 3 lines 9-12) and the intra-subsystem copy (column 13 lines 63-65, the copy management needs to include state information regarding implemented local mirroring to the gain benefits of having a local redundancy).

13. As per claim 9, Yanai ('377) discloses a computer system in which one or more production sites, and a local site consisting of only a storage device subsystem, or a remote site including a host and a storage device subsystem which are connected to each other (column 2 lines 31-40), are connected through a network (column 2 lines 37-39), wherein:

said production site comprises a host and a storage device subsystem (column 2 lines 31-34, the primary storage and its controller);

a disk unit of the storage device subsystem stores a copy management program (column 2 lines 65-67) and copy management information (column 2 lines 9-13);

said copy management information includes state information corresponding to each processing of a remote copy, said state information being used by the copy management program to execute the remote copy (column 3 lines 9-20, the lists are updated during remote copy operations and are used in the mirroring execution);

said copy management information is also kept in a storage device subsystem included in the local site or in a storage device subsystem included in the remote site (column 3 lines 9-12 the subsystem including the controller memory);

when making a remote copy from a storage device subsystem in this computer system by use of the copy management program, a host included in the production site updates copy management information for each processing of the remote copy by synchronizing copy management information included in the local site or the remote site

with copy management information in the production site (column 3 lines 9-13, both controllers' lists are updated during the mirroring execution); and

when the production site fails, the copy management information stored in the storage device of the storage device subsystem included in the local site or in the remote site is referred by use of a copy management program that operates in a host included in another production site to execute copying from a point to which the copy processing has progressed before the failure (column 26 lines 46-51).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai ('377) in view of Coverston (US Patent 5,504,883)

Yanai ('377) discloses a computer system according to claim 1, wherein:

said copy management information includes state information about the inter-subsystem copy (column 3 lines 9-12), and state information about the intra-subsystem copy (column 13 lines 63-65, the copy management needs to include state information

regarding implemented local mirroring to the gain benefits of having a local redundancy).

Yanai ('377) does not disclose the system wherein said copy management information includes time stamp information about the time at which this copy management information is written.

Coverston ('883) teaches a system that stores timestamp with redundant control information when backing it up to a secondary storage (see abstract).

At the time of invention it would have been obvious to a person of ordinary skill in the art to modify the system disclosed by Yanai ('377) such that redundantly stored management data is stored with associated timestamp data, as taught by Coverston ('883). This modification would have been obvious because the timestamps can be used to ensure data integrity upon a failure (Coverston ('883) column 3 lines 45-48).

Conclusion

The prior art made of record on accompanying PTO 892 form and not relied upon is considered pertinent to applicant's disclosure. Specifically, Voigt ('604) teaches a system that uses redundant controllers with memory in each one that maps out a mirrored virtual disk, Ito ('986) teaches a system that uses redundant main data for use as snapshots and redundant administrative data including log records, file locations and

data management files, Hinshaw ('442) teaches a database system where each storage processor includes redundant mirror management for redundant data, Kern ('665) teaches a storage mirroring through chained copying from one storage controller and disk to another wherein each storage controller maintains information about itself and the other directly connected controllers, and Brown ('414) teaches a mirroring within a storage area network using redundant array management functions that manager a mirrored virtual disk.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Schell whose telephone number is (571) 272-8186. The examiner can normally be reached on Monday through Friday 9AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

SCOTT BADERMAN
SUPERVISORY PATENT EXAMINER